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AUTHOR	Bailey, Charles-James N.
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ABSTRACT

Psychological explanations of the choices of the orthographic symbols and the dialectal and other variations of orthographic symbols in ancient Greek are examined in the determination of the pronunciation of the modern Greek "zeta". The pronunciation of the "double-delta" that corresponds to it in Boetian, Thessalian, Elean, Cretan, Laconian, and in the dialect of Megara is also considered as supportive research. In this connection, its voiceless congener spelled as "double-tau" or as "double-sigma" in various idioms is examined. The author contrasts previous theory with his own. Extensive documentation and a bibliography are included. Corrections and additions made by the author after publication are appended. (Author/RL)

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Bill J. Darden
Charles-James N. Bailey
Alice Davison

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THE PRONUNCIATION OF ZETA IN ANCIENT GREEK

Charles-James N. Bailey
(University of Chicago)

The determination of the pronunciation of an orthographic symbol in a dead language needs to be motivated by psychological explanations of the choices of the orthographic symbols and the dialectal and other variations among them. One cannot limit one's attention to phonetic realism and the prior and subsequent phonological developments of the segments represented by such symbols.[1] You cannot determine the pronunciation of ancient zeta without also determining the pronunciation of the double-delta (single delta next to a boundary or consonant) that corresponds to it in Boeotian, Thessalian, Elean, Cretan, Laconian, and possibly in the dialect of Megara. It is also necessary, in this connection, to determine their voiceless congener spelled as double-tau or as double-sigma in various idioms. In Boeotian and Central Cretan (Lejeune 1955:98) double-delta and double-tau are palpable orthographic as well as phonological parallels in the voiced and voiceless orders and need to be explained as such.[2]

At the outset here, three working principles that will set limits to possible solutions of the present problem need to be enumerated:

i) There are found in Indo-European and other languages the following unidirectional sound changes:

1) gy --> g'y	ky --> k'y
2) y, dy --> d'y or d^z:[3]	ty --> t'y or t^s:[3]
3) g'y, d'y --> $d'\check{z}$ (= jj) or $\check{z}d'\check{z}$[3]	k'y, t'y --> $t'\check{s}$ (= čč) or $\check{s}t'\check{s}$[3]
4) $d'\check{z}$ --> $\check{z}\check{z}$ (or d^z:)[4]	$t'\check{s}$ --> $\check{s}\check{s}$ (or t^s:)[4]
5) d^z: --> ðð [4]	t^s: --> þþ[4]
6) $\check{z}(\check{z})$, ð(ð) --> z(z)[4]	$\check{s}(\check{s})$, þ(þ) --> s(s)[4]

While the changes just tabulated are well-recognized and established, we shall require anyone advocating the following changes first to demonstrate that they are possible:

1) Any unit --> zd or žd[5]

2) zd --> z(z) (Matthews 1954/5:80) or ðð; how could *zd yield both zz and dd (see [2] below)?

3) dz --> dd or nd (Rohlfs 1962:3, 6), ts --> tt (Lejeune 1955:90), t'š --> tt (Allen 1957/8:116,126-27), and so on.[6]

4) ž(ž), š(š) --> stop.

On the other hand, we shall not hesitate to allow these changes:

1) zd --> dd; st --> tt.[7]

2) dz --> zz, ðð; ts --> ss, þþ.

3) (Probably) dz --> d'ž, žd'ž and ts --> t'š, št'š, provided these latter already exist and the phonological pattern leaves little choice (Allen 1957/8:127).

What will be regarded as the weakest of all explanations for non-sporadic changes of the sort under consideration in Greek will be metathesis (Witton 1898:429, Allen 1951:945, 1957/8:121 n.40, but 1968:55, Driver 1955: 231; for examples of sporadic metathesis, cf. Rohlfs 1962:5 n. 1, Ladefoged 1967:149; the explanation of metathesis goes back at least to Havet 1878:193); contrast the regular reversal of [α grave] and [-α grave] consonants in clusters which is described by Lejeune 1955:59-60, Buck 1955:74.

Whatever classical Attic zeta may have been, it changed to a fricative in Hellenistic Greek. The change had been made soon after the middle of the fourth century B. C. (Matthews 1954/5:73, Sturtevant 1940:93, etc.). Presumably zeta became žž at this time (see below); at any rate, it later became zz and eventually the modern Athenian z.

ii) Since a fronted velar and a palatalized dental have the same articulatory place somewhere between them--[g'] = [d'] and [k'] = [t'], though the fronted velars lack a concomitant apical articulation--one should not be surprised either at spelling alternations like Mycenæan ke : ze (Mühlestein 1955:130, Lejeune 1958:136, and the citation of Palmer by Lejeune [1958:90 n. 17]; note that voicing was not indicated in most instances in the Mycenæan syllabic script) or "x" : "ss."[8] And we shall certainly regard a secondary use of letters otherwise symbolizing [d t s] to denote palatal sibilants (including assibilates) in Greek as no less possible than in English verdure, nature, sugar.

The presuppositions will be important when we consider, first of all, the orthographic alternation "tt" : "ss" in ancient Greek. The oldest Attic inscriptions have "tt" from *ky, though the oldest literary use imitated (Lagercrantz 1898:90-91) the Ionic spelling with double-sigma until the orthographic reform in 403 B. C. The logic of the sound development, ky --> k'y --> t's --> ss, demands that we regard the orthographic alternation "tt" : "ss" as representing the phonetic alternation [čč] (= [t's]) : [šš].[9] It is not necessary to believe that in Attic all examples of sigma from *t (including words like dóxa, dípsa) are to be interpreted as [š]; this sigma may just as well be derived from an earlier *t^{s}.[10] But within the framework of Greek writing, the only way that I see to make sense of the double-sigma spellings exemplified in Attic grápsassthai, eisstén, and Léssbon, is to accept the suggestion first put forward by Boeckh (Blass 1888:90) that before a consonant double-sigma represented [š ž]. For examples in other dialects, see Buck (1955:75), and compare "sz" in Attic endészmous (Schwyzer 1953:218). This view would accord quite well with spellings like Zmýrna in Hellenistic Greek and the likelihood that reflexes of *gy and *dy would have passed through the stage [žž] on the way to becoming modern [ʒ].

Before concluding with the voiceless phonological equivalents of zeta, one ought to ascertain whether the assumptions and conclusions that have been stated thus far are compatible with the known history of Greek writing. The results of such a check are very rewarding. In Asia we find the reflexes of *ky and *tw written with Semitic letters. One assumes that such a special writing indicates either the inadequacy of ordinary letters to indicate a given pronunciation; or else that it indicates a different pronunciation from that denoted, ambiguously or unambiguously, by the ordinary orthography. Now Pamphylian writes the segment with the Semitic shin, 𐤔 (Thumb-Scherer 1959:187). Here one is to assume that the special letter was used because of the ambiguity of sigma.[11] But some Ionic dialects use here the Carian form of the Semitic ṣade (Lejeune 1955:76, Buck 1955:18, Allen 1968:57-58; the older views of Witton [1898:423-24] and Lagercrantz [1898:93-96] require modification), a letter which in Semitic represented the so-called "emphatic" (that is, pharyngealized) sibilant. This presumably happened because the local Ionic pronunciation differed from both the [s] and the [šš] which our previous considerations would lead us to regard as the usual pronunciation in other Ionic locales. The form of the Carian letter was T. The letter for an "emphatic" in Semitic would be as suitable as any, indeed better than any other, to represent a Greek assibilate. In fact, another form of ṣade 𐤑, called san, represents in Arcadian

what most scholars take to have been [t^s]. The resemblance of the Carian letter to Greek T cannot be overlooked. Indeed, it offers an obvious explanation for the double-tau writing of the same sound, presumably a palatal affricate, in Attic and other dialects. Compare Ephesian téTaras with Attic téttares (Thumb-Scherer 1959:264; for Halicarnassus, cf. Schwyzer 1953:318), and these with Ionian and Arcadian tésseres. The logic of the situation demands a contrast between a phonologically older [čč] and a younger [šš]. Additional confirmation is found in the Thessalian spelling of Thessalós as "Pétthalos," where the affricate pronunciation will seem more or less obvious to different scholars, and in the use of "ss" in Boeotian, where the reflex of *ky was normally spelled "tt," to indicate a foreign, no doubt unaffricated, pronunciation (Lagercrantz 1898:8-9). Finally, spellings like Cretan T(t)ena for Dena (=Ionic zēna) and tōna (where the initial segment was Proto-Indo-European *y) for what is zōnē in Attic indicate that if either zeta or double-tau was an affricate, the other was also one. Though it is generally agreed that the segments represented by zeta and delta merged into the voiced fricative [ð] in Elean, the spelling "tt" for "z" (Lejeune 1955:97, Buck 1955:71-72) makes one wonder whether this could be true.

Mycenæan may have had čč beside a more common šš as the reflex of *ky. The pronunciational diversity would be expected in a rapidly developing lingua franca, even though Mycenæan curiously enough shows few of these expected diversities. Otherwise, it might be thought odd to find a change (čč > šš) in Mycenæan antedating the same change in Attic by hundreds of years. The view of Mycenæan just stated is predicated on the variation between ke and ze mentioned earlier and the likelihood that "z" represented an affricate (otherwise, why not "s"?), as well as on the use of both "s" and "z" syllabograms for reflexes of *ky, *thy, and possibly *tw (Muhlestein 1955: 122-29; cf. Chadwick 1955:85-87, Lejeune 1958:133,100 n. 62, and the convenient table provided in Lejeune 1958: 134).[12] The Mycenæan syllabogram no. 85, which Chadwick (1955:90), following Sittig, suggests should be transcribed as si^2 may really represent či or ši, rather than s(i)ja (where "j," as usually in Mycenæan studies, represents yod). This character always stands word-initial except in a Pylian toponym ($a\text{-}85\text{-}ta^2$), and may in some cases reflect *tw.

Thus we see that a wide-ranging set of orthographic and phonological facts tie into a neat and consistent bundle when it is assumed that the voiceless equivalent of zeta was a palatal--an affricate when spelled with tau, a non-affricate when spelled with sigma. The phonological expectation in the voiced order would be [ǰǰ], parallel to voiceless [čč]. The orthographic parallel

to double-tau would be double-delta, as some writers (especially Lagercrantz 1898:46) have recognized.[13] This is in fact what is found in place of zeta in some dialects and in some environments in Attic, as will be shown. The parallelism fails when one looks at zeta itself. The phonological expectation would be [žž], corresponding to "ss" (= [šš]), where not [jj]. The pronunciation [žž] probably existed in early Hellenistic time; at least Sanskrit transcribed horizōn as hariya (Wackernagel 1896: 137,142). And the Greeks transcribed Iranian Šatadrus as Zárados. But classical zeta as undeniably contained a stop segment as a palatal sibilant segment.[14] This failure of zeta to represent the voiced counterpart of double-sigma or double-tau in orthography or in pronunciation defines our problem in terms of the first two working principles.

iii) The third working principle is one stated some time ago by Sturtevant (1940:61-62) in connection with the orthographic variation between "hr" and "rh" representing Greek voiceless [r̥]: When psychologically unitary consonantal elements are represented by digraphs, the letters may indifferently be written in either order. (Compare further Ladefoged 1967:149.) In English we find both "wh" and "hw" for voiceless [w̥]. Unfortunately, Sturtevant neglected his own insight when dealing with zeta; for he assumed that it was [zd] in some instances and [dz] in others. If Sturtevant's principle is correct, and if zeta was a psychological unit in Greek, it follows that we cannot rely on the testimony of the ancients regarding the order of the sibilant and stop elements which classical zeta must have contained.[15] Both Dionysii[16] lend their authority to [zd], though this is denied by Velius Longus (Rohlfs 1962:4,5). Most modern authorities[17]--few have added much new to the brilliant exposition of Blass (1888:112-22)--favor the pronunciation [zd] (most recently Allen [1968:53]), or else allow both [zd] and [dz]. But Rohlfs (1962:7) favors only [dz].

It is generally acknowledged that soon after the middle of the fourth century B.C. zeta began to become a non-affricate.[18] The Latins transcribed the Attic sound with "ss" (examples in Sturtevant [1940:93]); so Tarentine Greek (Witton 1898:430). Even in Attic zeta came to be spelled as a geminate,at least in certain cases (Schwyzer 1953:218). Blass (1888:120) spoke of Cretan thálaththa as having"spirantic th, a sort of compromise between genuine Cretan thálatta and the usual thálassa," and I suspect that double-theta here shows a development comparable to that indicated by "z" in Castilian esperanza. In late Hellenism zeta became [zz] or the modern [z̧]. Already in the sixth century B. C.

Argive Greek had hoiz de for hoĭs dè (Schwyzer 1953: 217). This more likely denoted [hoĭžd'è] than [hoĭzdè], in view of spellings like Léssbon. Since Doric delta could represent [ǰ] = [d'ž], the pronunciation may have been [hoĭžd'žè].

If it is clear that zeta was a palatal (further evidence will be found below in the use of zeta to transcribe foreign affricates), that it was voiced, that it contained a stop segment, and that it contained a sibilant segment, it remains only to examine which of the following four possibilities is the right one: (1) The sibilant came only at the end; in this case classical zeta would have to be [dz], for [d'ž] would be identical with the double-delta spelling, and the orthography would no longer make sense. We shall simply examine the general case for a sibilant-final zeta. (2) The sibilant came only at the beginning, as maintained by the most notable grammarians. (3) Zeta had the two pronunciations [d'ž] and [žd]. (4) The sibilant came in both places, the stop forming the middle segment. This would mean that zeta was like the Slavic [žd'ž] (the voiceless equivalent in modern Russian is represented by the letter š'ča, also found for sk' in modern Aegina Greek [Thumb 1910:15]). Developments like *zd or *zdz are unknown, and even Slavic žd in meždu comes from *dy only through *žd'ž. It should be emphasized that the explanation for the development of such a unit in Slavic requires the existence of [žd'] from sources other than simply *d'y, namely from *zd' > *žd' (Diver 1955:231-32). But this condition is met in Greek if Léssbon contained [žb], as argued earlier; for "ssd" would then indicate [žd']. That this is not simply an orthographic possibility, but also a phonological one is confirmed by the development of Sanskrit nīḍáḥ "nest" from *nisdos through *nizdos and *nižḍos (Meillet 1964:97, Kuryłowicz 1956: 113), though it must be admitted that this development involves specifically Indic retroflexion.

The time has come to present the often-cited evidence for the presence of the sibilant segment of zeta before the stop and after it. First, the evidence for the sibilant after the stop. The evidence is qualitatively and deductively compelling, but empirically weak. (1) First, there is the expectation from our first working principle that *gy and *dy would yield an affricate pronunciation. (2) Then there is the suggestive parallel with the other double letters, ksi and psi. One should also note the pleonastic spelling "xs" for ksi in Chios and Corinth (Blass 1898:115). (3) Thirdly, there are the borrowings in which the Greeks transcribed the Indic place names Ujjayinī (> middle Indic Ujjenī) and Pañcāla- as Ozénē and Pazálai (also as Pássaloi; Wackernagel 1896:137). For Indic Jhoĭlasa the Greeks wrote Zōílou, and for Indic Bharukacchas they wrote Barýgaza. (Vide further Meillet

[1916:53].) Greek borrowed Latin [d'ž] in coiux and Iulia as zeta in kozous and Zoul(e)ia. However, these last, as well as some of the former, examples must have been borrowed after zeta had ceased to be an affricate. They therefore contribute more to the proof of zeta's palatal character than to its claimed affrication, and not even very much to that. (4) Fourthly, there is the [dz] found in various modern island and Italiot Greek dialects (the evidence is summarized in Rohlfs 1962; cf. Matthews 1954/5:73). Only if something similar existed in ancient times can we make sense of the derivative uses of zeta and "z" in Greek dialects and in Oscan, Umbrian, and the Romance languages-- uses which constitute our next two bits of evidence in favor of a sibilant-final zeta in ancient Attic. (5) In dialects of Greek where zeta was replaced by double-delta or "sd" zeta was free to represent the affricates that developed from *dy in literary Lesbian (for example, kárza = Attic kardíā), Cyprian (kórza), and Pamphylian (korzia; Schwyzer 1953: 330). Most authorities[19] agree that here zeta represented [dz], the only voiced assibilate left if a palatal one already existed (a parallel development is seen in the Slavic so-called second palatalization). The reflex of earlier *ts was represented by zeta in early Central Cretan, while the reflex of *k^{w}e was spelled tze in Arcadian (Risch 1955:75) and Laconian (Buck 1955: 267). Zeta replaced gamma in azathaĩ (vide Schwyzer 1953:209) with a value that all must agree is "ganz unsicher" (Schwyzer 1953:329). (6) The Oscan and Umbrian native orthographies employed their version of zeta to represent the voiceless affricate [ts]. The Italian use of "z" to denote a voiced or voiceless dental affricate goes back to a vulgar Latin usage no doubt based on Greek dialectal uses. Not only did Latin write zabulus for diábolos and zebus for diēbus; it even transcribed Greek baptízō as baptidio and óryza as oridia. (7) A final consideration is the following. If zeta represented [zd] or [žd'], rather than an affricate, why was it ever represented by a single letter, rather than the orthography "sd" that was clearly available everywhere?

The evidence for a sibilant segment at the beginning of zeta is quantitatively and empirically much more compelling than the evidence for a sibilant at the end. (1) First is the evidence of the grammarians already referred to. (2) If zeta ended with a sibilant, why are spellings like "sz" found in Attic, but never "zs," like the pleonastic "xs" occasionally found in ancient Greek? (3) Another factor, very important but one whose significance has been misinterpreted by some investigators, is the use of "sd" in literary Lesbian

corresponding to inscriptional zeta. The same "sd" is found in literary Doric[20] (whence Oscan Niumsdiēis in the Greek alphabet) instead of the indigenous double-delta. We shall return to the "sd" orthography below. That zeta at least began with some kind of fricative is also attested by the way Aristophanes is said to have represented a Laconian attempt to pronounce Attic zeta at the beginning of a word: Bdeũ (=Zeũ, probably in Lycistrata, 940 [Allen 1968:54]). Beta here presumably represents a Laconian labial fricative. Since the Laconian reflex of *dy, spelled "d" next to a consonant or boundary, was no doubt [ǰ], the orthography in question must have meant [vǰeũ]. (4) Fourthly, there is the deletion of the nasal in the preverb syn- "with" before Attic zeta, as in syzō̃ "I live," a phenomenon otherwise found only before sigma.[21] Compare with this the preposition with sigma in ex Zéas (Blass 1888:114), where one would look for ek before an ordinary consonant. (5) Then there is the use of zeta for earlier *zd in words like ázō "I dry" (compare Czech ozdit), hízō "I sit," and ózos "twig," as well as in Athénaze (from Athenas-de).[22] To these examples one may add zeînamen (=sbénnumen) from Hesychius, where zeta represents the older zd of this clearly non-Aeolic dialect (locale not given by Hesychius). (6) Sixth are spelling errors like ézō̃n for éstō̃n on a Delphic inscription (Blass 1888:118). Compare Homeric and Ionic mazós for Mast(h)ós in other dialects (Blass 1888:117). The spelling "sz," found in Attica for zeta and in Boeotia for *zd (see under [8] below), attest to a sibilant beginning for zeta. In view of the possible parallelism (Blass 1888:115) with spellings like "sst" noticed earlier, as though "sz" = "ssd," one might see in "sz" further evidence of the palatal pronunciation of zeta. (7) There are borrowings in which Greek writes Semitic Aždōd as Azōtos, Hellenistic Asdōd, and Iranian Mazdarā and Aura-mazdā as Mazárēs and Oromázēs, Hellenistic Oromásdou. The later Hellenistic spellings just cited show a loss of the stop element of zeta. Or do they? (8) The likelihood of another explanation is our last and perhaps main point. We know that in Lesbian the literary "sd" was the same as the inscriptional zeta. Let us see what follows from supposing that here delta could represent [ǰ], as in the closely related Thessalian and Boeotian dialects. This would mean that the literary "sd" represented [žd'ž] on all the grounds that have been cited, and this tallies exactly with the interpretation of zeta which I have been trying to build up! This explanation harmonizes with two Orthographic anomalies, one in Attic, a zeta dialect, and the other in Boeotian, a delta dialect. Blass (1888:116) long ago noted the importance of the poetic word (h)érdō "I work," where a zeta would be expected in place of the delta that is actually found.[23] Now sibilants were lost between consonants in Greek, so that in *wérgyō it would be quite in order to expect a

reduction of either zd or žd'ž to d or d'ž, respectively.[24] Why should one think that the reduction was from žd'ž to d'ž (= [ǰ]), rather than from zd to d? We have seen that sibilants before t, b, m, and so on, were palatals, spelled "ss." Furthermore, we never find zd(z) as the reflex of a phonological unit elsewhere. Another reason will emerge from an examination of the Boeotian writing (Schwyzer 1923:231) of Theószotos (for Theósdotos) and Thiozótā (for Thiosdótā). It has been already seen that Greek clusters of sibilant plus stop developed a palatal sibilant that was sometimes spelled with the double-sigma. A stop d would be attracted to the palatal position in such a cluster, since stops more often than not show subdistinctive assimilations (Daniel Jone's "similitude") to adjacent fricatives. Boeotian writers evidently felt that "sd" would not symbolize this pronunciation [žd'] (which probably was replaced at once by [žd'ž], but that does not matter) as adequately as zeta, otherwise unused in Boeotian because Boeotian represented the reflex of *gy and *dy, namely [ǰǰ] = [d'ž], with the delta spelling.[25]

If zeta was pronounced [žd'ž] = [žǰ], it is easy to understand its use in transcribing various sorts of affricates, foreign and domestic, as well as sibilant-stop sequences in Iranian and Semitic. In any case, the evidence leaves no room to doubt that the stop segment in zeta was both preceded and followed by a sibilant element.

Did zeta represent two pronunciations, one with the sibilant segment first and one with it last; or did it represent [žd'ž] = [žǰ], as I think? Professor E.P. Hamp, to whom I am indebted for comments on this paper, points out that one has to admit both possibilities. If tau or sigma could stand for both non-palatals and palatals, zeta could represent both sibilant-initial and sibilant-final clusters. However, the double pronunciation is from the psychological point of view a bit more difficult. There is the further weight of my interpretation of literary Lesbian zeta as [žǰ] in accord with what seems to me compelling evidence that delta in the closely related Thessalian and Boeotian could represent [ǰ]. I doubt that zeta could represent both [žǰ] and anything else, whatever might be the possibilities that it could represent both [žd] and [d'ž]. The existence of sibilant-stop phonological units is in any case very doubtful.

The interpretation of double-delta and zeta preferred here, as [d'ž] = [ǰǰ] and as [žd'ž] = [žǰ], respectively, gives psychological motivation to the orthographies that are found and invokes only phonological developments that are very probable. Our three working principles thus get entirely satisfied. The conflicting evidence and explanations that have previously been written about are now resolved. The explanation of the Boeotian spellings

Theószotos and Thiozótā given above will also explain the only matter remaining to be accounted for,[26] namely the use of zeta in Attic words like ózos, hízō, and Athénaze, and need not be repeated here.

During the Hellenistic period Attic [čč] and [žǰ] became [šš] and [žž], respectively, and these de-palatalized in late Hellenistic times. When the palatals were de-palatalized, combinations like [št šp žb žm] automatically became [st sp zb zm]. Contemporary dialectal [dz] goes back to [d'ž], an easily intelligible simplification of [žd'ž], though a simplification to [žd], as in Slavic méždu, would also be possible. (If in any modern dialect [dz] is descended from [žd'ž], it is explicable because the de-palatalized [zdz] would be a unit which is unknown in languages, and would therefore be prone to be replaced by [dz]. The palatal and dental affricates found in some modern dialects [Thumb 1910:15, 19-20] go back to classical velars and in some cases [Thumb 1910:23-24] dentals.)

My views of zeta avoid the grave weaknesses of the other views: the contradictory proofs concerning the sequence of the sibilant and stop segments, the failure to maintain the palatal status of zeta, the necessity of supposing an unlikely metathesis or the impossible changes *tš, *ts --> tt and *dž, *dz --> dd to get Attic and Boeotian "tt" and Boeotian "dd," and the necessity of an unattested change *zd --> z to get the modern pronunciation of zeta.

FOOTNOTES

1 While Allen (1957/8) strives for phonetic realism, he fails adequately to motivate the psychological choices of the orthographic symbols. A decade ago he was of course unaware (Allen 1957/8:123) of the possibility of allowing for synchronic rule-ordering in the sense of generative phonology, let alone of the possibilities offered by rule-re-ordering for lexical exceptions (Bailey 1968). His manner of dealing with junctures (Allen 1957/8:124) needs greater clarity.

2 The complex dialectal developments are tabulated for the voiceless order by Lejeune (1955:90). In Attic some instances of original *ty underwent the minor rule, ty --> t'y = k'y; otherwise, *ty --> *[t^s:].

3 For example, Slavic. The replacement in (2) by a dental assibilate (exemplified in the Slavic so-called second palatalization) seems to depend on the current existence of palatal affricates. On the other hand, we see in the history of French change (4) being caused by a simultaneous change (3). For tabulations of expected changes which differ from mine, cf. Allen (1957/8:115, 126), Matthews (1954/5:77), Witton (1898:430). Various writers have expressed the view that zeta (other than late literary zeta in Lesbian and zeta in Cyprian, Arcadian, and Cretan) at least passed through a palatal affricate stage (Risch 1959:219, Roussel's view cited in Matthews [1954/5:64], and Meyer's view cited in Blass [1888:120 n. 450 b]). For its voiceless equivalent spelled double-tau and double-sigma the palatal affricate stage is more widely recognized (Walters and Conway 1928:76, Hamp 1959:190, Allen 1968:57; cf. Pedersen 1923:113,115).

4 For example, Romance. The change d'ž --> dz is exemplifiable in Venetian mazore (= standard maggiore) and za (= standard già). The parallel change in the voiceless order is more difficult to exemplify. For ts --> c, cf. Castilian esperanza.

5 Matthews (1954/5:68,78); Slavic žd in méždu apparently did not come directly from *dy, but through the mediary of *žd'ž. Anyhow, the Slavic change does not prove that *dy can become a non-palatal zd, despite attempts to justify the latter with the former. Note that zð can yield z, at least before m, as in English asthma(tic).

6 Proto-Greek *ts easily gave s(s); for the Boeotian reflex (double-tau), vide infra.

7 Matthews 1954/5:80, Rohlfs 1962:4, Thumb-Kieckers 1932:85. These changes are uncommon, but nevertheless are found in Greek dialects. Compare ette for éste at Orchomenos and late Laconian ettan for estàn (Schwyzer 1953:216, Buck 1955:73-74). Prof. Hamp points out the change from st to t through the intermediate ht found in Spanish dialects. Note also the change z --> d in English isn't, doesn't, wasn't.

8 Vide the words cited by Lejeune (1955:85 n. 8; cf. possibly p. 63 n.1); and cf. Sanskrit "kṣ" (= [k'ṣ]) with the fact that in English "ak Chicago" sounds just like "at Chicago." For verbal forms, cf. Buck (1955: 72,116), Ruipérez (1953:257-58); note Cretan "tt" for "x" in logíttomai (Matthews 1954/5:71). For "x" instead of expected "s" (= "ss") in Mycenæan, cf. Lejeune (1958:94; but vide p. 96 n. 45). Schwyzer (1953:318) notes the use of ksi for expected "tt/ss" at Iasos and Teos. Lack of space forbids an analysis of the sound development in dóxa and dípsa. Xeus in Theran is a purely orthographic change (Buck 1955:18) and is therefore irrelevant here. Finally, it is worth noting that Latin transcribed Greek malássō as malaxo (but vide Postgate 1906). I shall not attempt to comment on the spelling krábaktos, cited from the Codex Sinaiticus by Schulze (1895:375 n.4).

9 Geminate spellings were simplified next to a consonant or word boundary. So "tt" became "t," "ss" became "s," and "dd" became "d," as in Boeotian Deus. Word-initial alternations between "t" and "s" indicate palatal segments: t/sēmeron, t/sētes (see list in Witton 1898:428-29; cf. Pedersen 1923:113). Compare Gortynian kartónans (Lagercrantz 1898:45), with "t" from *ty. Compare also sáō with diattáō. Even word-initially, the palatals became geminates after preceding vowels, like the palatals in modern Italian. Besides the last examples, one should notice Homeric ássa, made by false division from neuters ending in -a plus čča (from *tya). Seúō often made position (Witton 1898:428), though sometimes not only zeta but even "sk" did not (Blass 1888:116). The double-zeta found in later Greek is due (except perhaps in foreign names; Schwyzer 1953:218) to the change of classical zeta to a plain sibilant fricative.

10 Lack of space prohibits exhausting the orthographical alternations of "t" : "s" even in Attic, where both represent the development of *t before yod or front vowels. It is doubtful that in ánti and mántis tau represents an affricate ([č]); compare pístis, esti. (All dialects have éti, árti Holt 1937:178-79). Both in básis and in pósis (where *t belonged to the root) the sigma in the

middle probably goes back to a proto-Greek alveolar affricate. In these words the rule merging *ty with *ky was inoperative. Following n it is phonetically difficult to keep ts and s or t'š and š apart. Cf. the comments by Witton (1898:421-22) and his citation of English conscientious; cf. further Schwyzer (1953: 322). I take sigma to stand for [s] in Thessalian and Cretan pánsa, Attic pãsa, and Lesbian paĩsa, as well as in the feminine present active participles, no less than in mésos and tósos. The same is true of sigma in dóxa and dípsa.

11

Sigma itself comes from shin also. One is tempted to speculate that the ancient pronunciation of sigma had the retroflexion often found in modern Greek. For s --> š in Modern Greek, vide Thumb (1910:para.28).

12

It is doubtful whether za = dià in Mycenæan; cf. Lejeune 1958:129.

13

Blass (1888:120) and Lagercrantz (1898:46) both recognize the importance of (h)érdō (vide infra) in this connection. The parallelism is reinforced by such spellings as Cretan T(t)ena for expected Dena (= Ionic zēna), as well as fluctuations in Cretan and Elean between "tt" and "z" (Buck 1955:71-72).

14

Matthews (1954/5:72-73) is incorrect in asserting that Archinus "defined δ and ζ as homorganic," that is, as dentals. What Archinus actually says is that both are apical, a statement quite in harmony with the fact that palatals in modern Romance languages, for example, are often no less apicalized (pronounced with the tongue tip on the teeth) than the plain dentals.

15

The only dissenters are Witton (1898:430,436), who favors [ž] for zeta, and Lagercrantz (1898:93-96), who suggests [ð] and other possibilities.

16

Their statements are Englished in Sturtevant (1940:90-91).

17

Their views are conveniently summarized by Matthews (1954/5:63-64) and Rohlfs (1962:1-2); vide also the references in Schwyzer (1953:329 n.1).

18

Aristotle (Metaphysics 993a 5-7) says, "For some say that za is (made up) of s, d, and a; others say that it is another sound, and not one of the well-known ones." (Sturtevant [1940:93 n. 106] says that this has been emended.) Whether an affricate or a non-affricate [žž] is being described here, the statement may imply a transitional period. But I think that little certain can be gleaned from this statement.

19
Otherwise, vide Witton (1898:433), referring to the views of Meyer.

20
Doric hísdō (= Attic hízō, both from *sízdō) "I sit" could be authentic.

21
I have been able to find no relevant examples of the treatment of the nasal in question before delta corresponding to zeta in appropriate dialects like Boeotian and Thessalian.

22
Blass (1888:116) and subsequent scholars take éraze and khamáze to have been created by false analogy. See Schwyzer (1953:330) for býzēn, etc.

23
Attic prose has rhézō with a different gradation of the root.

24
Nevertheless, Mycenaean has zeta in wo-ze = wórzei. It is not wholly impossible that the word contained a syllabic [r̥] in Mycenaean.

25
Authors who have maintained that "dd" represents an earlier pronunciation than zeta are no doubt wrong. There is no phonological reason for supposing [ǰǰ] to be an earlier reflex of *gy and *dy than [žǰ]; on the contrary, [ǰǰ] is a later simplification of [žǰ].

26
Except the Boeotian reflex of *ts spelled "tt." Allen (1957/8:127) suggests that *ts may have gone to tš. One must not close the door to this possibility. In any event, both *ts and *ty in all words yielded Boeotian [č(č)], probably because of some pattern merging. The merger of *ts with [čč]= [t'š] makes sense, however, only if "tt" represented [čč]!

ALLEN, W. Sidney. 1951. "Some prosodic aspects of retroflexion and aspiration in Sanskrit." Bulletin of the School of Oriental and African Studies, University of London, 13:937-46.

_____. 1957/8. "Some problems of palatalization in Greek." Lingua 7:113-33.

_____. 1968. Vox graeca: the pronunciation of classical Greek. Cambridge: At the University Press.

BAILEY, Charles-James N. 1968. "An untested idea on lexical exceptions to the regular ordering of the phonological rules of a language." Chicago Journal of Linguistics, 2:59-64.

BLASS, Friedrich. 1888. Über die aussprache des griechischen. 3d rev. ed. Berlin: Weidmannsche Buchhandlung. Englished by W. J. Purton (trans.), Pronunciation of ancient Greek. Cambridge: At the University Press, 1890.

BUCK, Carl Darling. 1955. The Greek dialects: grammar, selected inscriptions, glossary. Chicago: The University of Chicago Press.

CHADWICK, John. 1955. "La représentation des sifflantes en grec mycénien," in Lejeune (1956).

DIVER, William. 1955. "The problem of old Bulgarian št." Word, 11:228-36.

HAMP, Eric P. 1959. "Notes on early Greek phonology: 1. Assibilated clusters in Proto-Greek." Glotta, 38:187-90.

HAVET, L. 1878. "Notes de grammaire III: Sur les divers sons du grec: renseignements tirés des langues italiotes." Mémoires de la société de linguistique de Paris, 3:192-96.

HOLT, Jens. 1937. "Remarques sur l'assibilation grecque." Aarsskrift for Aarhus Universitet IX, Acta Jutlandica IX. København: Levin & Munksgaard.

KURYŁOWICZ, Jerzy. 1956. L'apophonie en indo-européen. Prace Jezykoznawcze 9. Wrocław: Zakład Imienia Ossolińskich Wydawnictwo Polskiėj Akademii Nauk.

LADEFOGED, Peter. 1967. Three areas of experimental phonetics: Stress and respiratory activity, the nature of vowel quality, units in the perception and production of speech. London: Oxford University Press.

LAGERCRANTZ, Otto. 1898. Zur griechischen lautgeschichte. Upsala Universitets Årsskrift. Upsala: Akademische Buchdruckerei Edv. Berling.

LEJEUNE, Michel. 1955. Traité de phonétique grecque. 2d rev. and cor. ed. Paris: Librairie C. Klincksieck.

_____ (editor). 1956. Études mycéniennes: Actes du Colloque International sur les Textes Mycéniens (Gif-sur-Yvette, 3-7 avril 1956). Paris:

_____ 1958. "Les sifflantes fortes du mycénien." Minos, 6:87-137.

MATTHEWS, W. K. 1954/5. "The pronunciation of Attic Greek ζ in the sixth and fifth centuries B. C." Lingua, 4:63-80.

MEILLET, A. 1916. Review of M. Fasmer, Izslèdovanie v oblasti drevnegrečeskoi fonetiki. Bulletin de la Société de linguistique de Paris, 20:52-55.

_____. 1964, a reprint. Introduction à l'étude comparative de langues indo-européennes. Preface by George C. Buck. Alabama Linguistic and Philological Series # 3. University, Ala.: University of Alabama Press.

MÜHLESTEIN, Hugo. 1955. "Zur mykenischen schrift: die zeichen za, ze, zo." Museum Helveticum, 12:119-31.

_____. 1958. "Einige mykenische wörter." Museum Helveticum, 15:222-26.

PEDERSEN, Holger. 1923. "Das auf einen t-laut zurückgehende σ und σσ im griechischen," in Ἀντίδωρον: Festschrift Jacob Wackernagel zur vollending des 70. lebensjares am 11. Dezember 1925, gewidmet von schülern, freunden und kollegen, mit einem bildnis. Göttingen: Vandenhoeck und Ruprecht.

POSTGATE, J. P. 1906. "On malaxo and μαλάσσω." Classical Review, 20:443.

RISCH, Ernst. 1955. "Die gliederung der griechischen dialekte in neuer sicht." Museum Helveticum, 12:61-76.

_____. 1959. "Frühgeschichte der griechischen sprache." Museum Helveticum, 16:215-27.

ROHLFS, Gerhard. 1962. "Die aussprache des z (ζ) im altgriechischen." Das Altertum, 8:3-8.

RUIPÉREZ, M.C. 1953. "Sobre la prehistoria de los dialectos griegos (A propósito de un libro de F. R. Adrados)." Emerita, 21:253-66.

SCHWYZER, Eduard. 1923. Dialectorum graecarum exempla epigraphica potiora. Leipzig: In aedibus Salomonis Hirzelii.

_____. 1953. Griechische grammatik: auf der grundlage von Karl Brugmanns Griechischer grammatik. Handbuch der altertumswissenschaft, Div. II, Part I, Vol. I. 3d ed. München: C. H. Beck'sche Verlagsbuchhandlung.

SCHULZE, Wilhelm. 1895. "Samstag." Zeitschrift für Vergleichende Sprachforschung auf dem Gebiete der Indogermanischen Sprachen, 33:366-86.

STURTEVANT, Edgar H. 1940. The pronunciation of Greek and Latin, 2d ed. William Dwight Whitney Linguistic Series. Philadelphia: Linguistic Society of America, University of Pennsylvania.

THUMB, Albert, 1910. Handbuch der neugriechischen Volkssprache: Grammatik, texte, glossar, 2d cor. and enlarged ed. Strassburg: verlag von Karl J. Trübner. Englished by S. Angus (trans.) A handbook of the modern Greek language: Grammar, texts, glossary. Chicago: Argonaut, Inc., Publishers, 1964.

_____, and KIECKERS, E. 1932. Handbuch der griechischen dialekte. 2d augm. ed. Indogermanische bibliotek, Div. I, Sect. I, Vol. VIII, Part I. Heidelberg: Carl Winters Universitätsbuchhandlung.

_____, and SCHERER, A. 1959. Handbuch der griechischen dialekte. 2d augm. ed. Indogermanische bibliotek, Div. I, Sect. I, Vol. VIII, Part II. Heidelberg: Carl Winter--Universitätsverlag.

WACKERNAGEL, Jacob. 1896. Altindische grammatik: I. Lautlehre. Volume I. Göttingen: Vandenhoeck und Ruprecht.

WALTERS, C. Flamstead, and CONWAY, R.S. 1928. Deigma: A first Greek book. 2d ed. London: John Murray.

WITTON, W. F. 1898. "On -ΣΣ- and -Z-." American Journal of Philology, 19:420-36.

Corrections and Minor Additions

P. 178,
l. 20-- for of (after explanation) read: by
l. 22-- read: [- grave] and [+ grave]
ll. 14-15 up-- read ʒʒ and ʒ
P. 179,
ll. 8, 10-- for t's read: t'š
P. 180,
l. 2-- after T insert: (which did not represent [š] or [s])
l. 17-- insert at end of line after where: alpha is long and
l. 17 up-- read: Mühlestein
P. 181,
l. 10-- Cap. 1st letter of Šatadruṣ
l. 24-- after [w]. insert: The order of the letters "rh" was no doubt determined by that of ph, th, ch.
P. 182,
l. 8-- change) to ; and insert following it: cf. n. 14)
l. 28-- add comma after namely
l. 23 up-- after semicolon delete for ... indicate and read instead: for unattested "ssd"--only "sz" is attested--could then have indicated [žd'ž], as explained in connection with hérdō below, or
l. 6 up-- before (3) insert: See further on concerning the relationship between ksi and zeta; cf. also n. 8.
P. 183,
l. 16 up-- Cap. 1st letter of Oridia.
l. 11 up-- at end of line add: If zeta was phonetically trisegmental, one letter might make sense, assuming a parallelism of a sigma-final zeta and ksi and psi. The attested "sz" makes excellent sense for [žd'ž]; so does "sd" in areas where "d" could represent [d'ž].
P. 184,
l. 17 up-- replace Or do they . . . explanation with: (8) They apparently also hark back to the memory of an affricated pronunciation of "(d)d," the establishment of which
l. 5 up-- insert after dialect.: Lesb. [žd'ž] was probably retained after Att. zeta had become a palatal fricative (viz. [žž] = [ž:]).
P. 185,
l. 14-- for Jone's read: Jones'
after first para. insert (what has been learned by me since writing this paper): Benedict Einarson ("Notes on the Development of the Greek Alphabet," Classical Philology, 62 (1967), 8-9) proposes that ⊢, representing Semitic ṣadē, was pronounced [zdc̃:]. After Ξ (later called ksi) was deprived of a name, for reasons explained by Einarson, the name [zdc̃:] was transferred to it because of the resemblance between Ξ and I (later called zeta). Einarson would see a subsequent transferral of [zdc̃:], enlarged with the addition of [ta], to Z (older I); or rather, Einarson proposes the replacing of the name [zc̃:ta] by [zdc̃:ta] for Z when "in Attic the phoneme zd absorbed the phoneme z" (p. 9). I should

prefer to think that, given the suitability of representing an affricate with either the voiced "z" or the emphatic ṣadē, zeta happened to be chosen right from the outset for Gk. [ž̌d'ž̌]. But I am in accord with Einarson's astute insight on the pronunciation of ṣadē as [zdč:], and would simply add that this pronunciation turned out to be an extremely appropriate name for the letter representing [ž̌d'ž̌] after it ceased to be needed to represent the original letter.

l. 15 up-- for zeta read: "sd".

P. 186,

l. 4-- at end of line add: Attic and other idioms retained "sd" at morpheme boundaries, as in toúsde. In such instances it is probable that sd did not become [ž̌d'ž̌] in the way it is being claimed that *zd in ózos, etc., become [ž̌d'ž̌].

l. 12-- for be read: have been

l. 13-- before descended insert: directly

P. 188,

n. 7, l. 2-- Delete: are uncommon, but nevertheless

n. 8, l. 2-- for [k'ṣ] read: [k'ṣ]

P. 189,

n. 18, l. 1-- for 993a read: 993 a

P. 190,

n. 21, at end add: Attention has to be paid to the mutual ordering of the rules deleting n before sC and the rules changing s to h.

P. 192,

add at end of LEJEUNE 1956 ref.: Centre National de la Recherche Scientifique.

sub PEDERSEN, for vollending read: vollendung
for lebensjares read: lebensjahres

sub THUMB 1910, change comma to period after Albert
Cap. first letter of Verlag
THUMB and KIECKERS and THUMB and SCHERER, for
bibliotek read: bibliothek